

Claim 2, for example, recites a resonant optical modulator including an electro-optical substrate, an optical waveguide formed in the substrate and having a variable index of refraction, and an active modulator electrode formed on the substrate in relation to the waveguide to effect electro-optical variation of the index of refraction upon application to the electrode of a modulating signal. The resonant optical modulator further includes an interface port formed on the substrate and providing the RF modulating signal to the electrode from a signal source. The signal source has an impedance. The resonant optical modulator further includes an electrical structure, formed on the substrate and coupled to the interface port and the electrode. The impedance of the optical modulator including the interface port and the electrical structure is substantially equal to the impedance of the RF signal source.

The Action relies initially on Toyohara for all the features recited in claim 2. Toyohara discloses a waveguide-type optical device and an impedance-matching method. Nowhere in Toyohara is there is disclosure or suggestion of a resonant optical modulator. This feature is not even addressed by the Action.

The Action also relies on Skeie for all the features recited in claim 2. Skeie discloses a linearized optical modulator with segmented electrodes. In Skeie, the electrode is bonded to obtain a better linearization of the modulation characteristics. Nowhere in Skeie is there a disclosure or suggestion that the optical modulator is resonant. The Action points to the Abstract's description of a 1 GHz frequency response, apparently to indicate that the optical modulator has a resonant frequency. However, this description of a frequency response does not indicate that the optical modulator is resonant, as recited in claim 2.

Since all of the features set forth in claim 2 are not shown by either Toyohara or Skeie, claim 2 is considered allowable over these patents.

Claims 1, 9, and 11 recite similar features as claim 2 and are considered allowable for at least the same reasons. In addition, claim 1 recites further features not disclosed or suggested by the cited patents.

Claim 1 recites an optical transmission system that includes an optical modulator similar to that recited in claim 2. Further, claim 1 recites that the optical transmission system includes an optical source for generating an optical signal and an RF signal source for generating an RF signal at a predetermined frequency. The RF signal source has an impedance, the optical transmission system also includes an optical amplifier for amplifying the optical signal to a power greater than 6 dBm and an optical fiber line for transmitting the amplified and phase modulated optical signal.

The Action relies on Toyohara for the features recited in claim 1. As pointed out above, Toyohara does not disclose or suggest a resonant optical modulator as claimed. Further, Toyohara does not disclose or support an optical amplifier for amplifying the optical signal to a power greater than 6 dBm. The Action alleges that it would have been obvious to modify the Toyohara device to include an optical amplifier. However, the Action does not explain why it would have been obvious for such an amplifier to amplify the optical signal to a power greater than 6 dBm. Given that this decibel level is associated with problems such as stimulated Brillouin scattering (SBS), as described, e.g., at page 11, lines 1-7 of the specification, Applicants respectfully submit that it would not have been obvious to use an optical amplifier for amplifying the optical signal to a power greater than 6 dBm as set forth in claim 1. For this additional reason, claim 1 is considered allowable over

Toyohara.

Claims 3-8 and 21-22, claim 10, and claims 12-15 depend ultimately from claims 2, 9, and 11, respectively, and are considered allowable for at least the same reasons. In addition, these claims recite further features not disclosed or suggested by any of the cited patents.

For example, claim 4 recites that the electrical structure includes a delay line connected between the interface port and the electrode. Claim 5 recites that the electrical structure includes a resonant stub connected at a first end to the interface port. New claim 21 recites that the impedance of the optical modulator is mostly reactive. New claim 22 recites that the delay line and the stub each have an impedance, and the impedance of the optical modulator is compensated for by the impedance of the delay line and the impedance of the stub. These features are not disclosed or suggested by Toyohara or Skeie. Therefore, claims 4, 5, 21, and 22 are considered allowable over these patents.

Claims 13 and 14 recite similar features as claims 4 and 5, respectively, and are considered allowable for at least the same reasons.

Claim 7 recites that the resonant frequency is in the range of 0.5 to 5 GHz. Claim 8 recites that the resonant frequency is in the range of 1 to 4 GHz. The Action relies on Skeie as showing these features. As noted above, the Abstract of Skeie mentions a frequency response of 1 GHz. However, nowhere in Skeie is there a disclosure or suggestion of a resonant frequency of the resonant optical modulator in the ranges recited in claims 7 and 8. Therefore, claims 7 and 8 are considered further allowable over Skeie for this additional reason.

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For the foregoing reasons, all the claims under consideration (claims 1-15 and 21-22) are considered allowable. A Notice to this effect is respectfully solicited. If there are any questions, the Examiner is invited to contact the undersigned attorney at the telephone number given below.

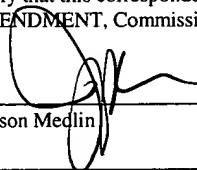
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